

PATENT ABSTRACTS OF JAPAN

(11)Publication number : 07-089053

(43)Date of publication of application : 04.04.1995

(51)Int.Cl.

B41F 31/02

(21)Application number : 05-234455

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(22)Date of filing : 21.09.1993

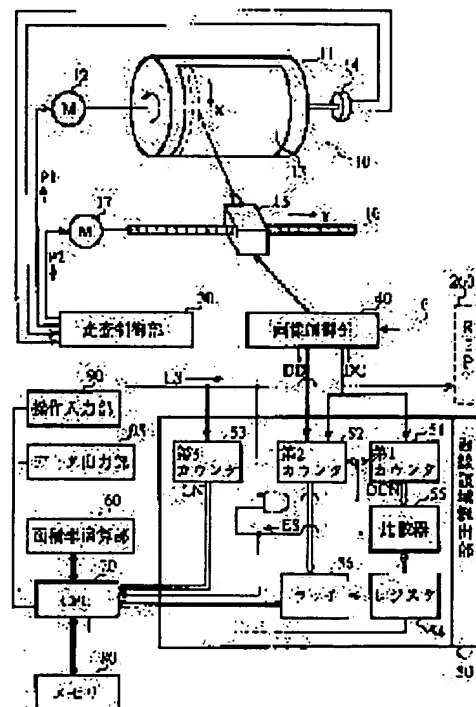
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(54) PRINTING PLATE FORMING APPARATUS

(57)Abstract:

PURPOSE: To simultaneously calculate ink quantity data of ink fountains of a printer by using image data to be used for exposure of a printing plate- forming apparatus.

CONSTITUTION: A printing plate-forming apparatus comprises an exposure unit 10 for directly exposing a surface of a plate material 13 based on bit map data 6 to generate a printing plate, a printing element area calculator 50 for virtually dividing the surface of the material 13 to set inspecting areas, integrating number of exposure data of the area from the data 6 to calculate exposure data of each inspecting area, and an area ratio calculator 60 for obtaining an area ratio of the element area of each inspecting area based on the integrated exposure data as ink quantity data.



LEGAL STATUS

[Date of request for examination]

02.12.1996

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]

[Date of final disposal for application]

[Patent number]

2918770

[Date of registration]

23.04.1999

[Number of appeal against examiner's decision of rejection]

[Date of requesting appeal against examiner's decision of rejection]

[Date of extinction of right]

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CLAIMS

[Claim(s)]

[Claim 1] While exposing the front face of said plate directly using the bit map data of the field which corresponds to the whole printing side of a plate, and contains a pattern part and a line drawing part and creating the printing version An inspection zone setting means to be the printing version listing device which computes the amount data of ink needed by presswork, to divide the printing side of said plate and to set up an inspection zone, A data addition means to integrate either the number of exposure data, or the number of non-exposing data out of said bit map data corresponding to said inspection zone, and to compute the addition data for said every inspection zone, The printing version listing device characterized by having an amount data calculation means of ink to compute the amount data of ink based on the addition data for said every inspection zone.

[Claim 2] Said inspection zone setting means is the printing version listing device according to claim 1 characterized by setting up an inspection zone so that it may become the rectangle field which has the die length corresponding to the field to which ink is supplied from one fountain of the printing machine which one side uses by presswork.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]**[0001]**

[Industrial Application] This invention relates to the printing version listing device in which creation of the printing version and calculation of the amount data of ink used for coincidence by presswork are possible especially about the printing version listing device used for a platemaking process.

[0002]

[Description of the Prior Art] Usually, printed matter sets to a printing machine the printing version created by the platemaking process, supplies ink to the printing side, and is imprinted and created by the form etc. Drawing 9 shows typically the relation of the printing version and the ink feeder of a printing machine in presswork. The printing machine has two or more fountains 300 arranged at the predetermined spacing crosswise [of the printing version 1] (drawing 9 longitudinal direction), and the ink supplied from a fountain 300 is supplied to the front face of the printing version 1 via various rollers. Accommodation of the amount of ink is attained every fountain 300 by adjusting the opening of a fountain 300, and the ink supplied from one fountain 300 is supplied to the ink zone 7 virtually divided on the printing version 1 front face corresponding to each of a fountain 300.

[0003] Since the printing field, the non-printed field or the field where an image consistency is large, the small field, etc. are intermingled, as for the printing side corresponding to the ink zone 7, it is desirable to adjust the amount of ink which should be supplied every ink zone 7. For this reason, the printing front face of the created printing version 1 is conventionally measured using the reader of dedication, it asks for the amount data of ink for every ink zone 7 from the area of the image part of the printing version 1, and the opening of a fountain 300 is adjusted according to this amount data of ink (JP,59-71863,A).

[0004]

[Problem(s) to be Solved by the Invention] However, the method of reading an image field in the created printing version directly, and asking for the amount data of ink needed the reader of dedication, and the amount data calculation activity of ink, and the processing was complicated for the operator. On the other hand, in case JP,4-12227,B separates the color of a photograph manuscript in the platemaking process over a photograph manuscript and creates the halftone dot film for every color version, it is indicating the approach of computing the amount data of ink used for adjustment of the fountain of a printing machine using color-separation image (pattern) data. However, by this approach, the amount data of ink are computed for every subsection field which divided and set further the printing field 9 of the page unit shown in drawing 9 as a large number. For this reason, to the printing version 1 with which two or more page fields 9 have been arranged, with reference to the amount data of ink computed by this approach about each page field 9, the area of null parts other than page field 9 also had to be taken into consideration, and the operator had to compute the amount data of ink for every ink zone 7 of the printing version 1 anew. Moreover, in JP,4-12227,B, since it was not contained in a processing object about line drawing data, such as an alphabetic character and a graphic form, about the printing version with which line drawing data are contained, separately, the operator had to compute the amount of ink, and had to compound and compute the amount data of ink for every fountain.

[0005] Therefore, this invention was made in order to cancel the above troubles, and it aims at offering the printing version listing device which can compute the amount data of ink for every fountain installed to the printing version using the image data of a platemaking process.

[0006]

[Means for Solving the Problem] While exposing the front face of said plate directly using the bit map data of the field which the printing version listing device concerning invention of claim 1 corresponds to the whole printing side of a plate, and contains a pattern part and a line drawing part and creating the printing version An inspection zone setting

means to compute the amount data of ink needed by presswork, to divide the printing side of a plate, and to set up an inspection zone, Either the number of exposure data or the number of non-exposing data was integrated out of the bit map data corresponding to an inspection zone, and it has a data addition means to compute the addition data for every inspection zone, and an amount data calculation means of ink to compute the amount data of ink based on the addition data for every inspection zone.

[0007] In the printing version listing device concerning invention of claim 2, an inspection zone setting means sets up an inspection zone so that it may become the rectangle field which has the die length to which ink is supplied from one fountain of the printing machine which one side uses by presswork.

[0008]

[Function] The printing version listing device of this invention receives as an input the bit map data of the field which corresponds to the whole printing side of a plate, and contains a pattern part and a line drawing part. And the front face of a plate is exposed directly and the printing version is created. Moreover, the amount data of ink needed by next presswork are computed by using bit map data for coincidence. For this reason, first, an inspection zone setting means divides the printing side of a plate, and sets up an inspection zone. And a data addition means integrates either the number of exposure data, or the number of non-exposing data out of the bit map data corresponding to an inspection zone, and computes the addition data for every inspection zone. Furthermore, the amount calculation means of ink computes the amount data of ink based on the addition data for every inspection zone.

[0009] Moreover, in the printing version listing device of invention of claim 2, an inspection zone setting means sets up an inspection zone so that it may become the rectangle field which has the die length to which ink is supplied from one fountain of the printing machine which one side uses by presswork.

[0010]

[Example] Hereafter, the example of this invention is explained to a detail using drawing. Drawing 1 is the block diagram showing the configuration of the printing version listing device by the example of this invention, and drawing 2 is the block diagram having shown typically the whole platemaking system configuration containing this printing version listing device. This platemaking system is constituted from online or a printing version listing device 100 by which off-line connection is made by an image processing system 200 and this.

[0011] First, the outline of the configuration of an image processing system 200 and processing is explained. An image processing system 200 is equipped with the image input scanner 210, the line drawing processor 220, the actuation input devices 230, such as a keyboard and graphic display, the store 240 that memorizes image data, edit equipment 250, and RIP (raster image processor)260 with reference to drawing 2.

[0012] Drawing 3 shows the flow of processing of each equipment in a platemaking system based on changes of data. Hereafter, with reference to drawing 2 and drawing 3, the outline of processing of an image processing system 200 is explained. The image input scanner 210 reads the photograph manuscript 2, performs color-separation processing, and creates the pattern data 3 of each color (Y, M, C, K) of every per manuscript. Moreover, the line drawing processor 220 consists of a computerized-type-setting machine, a digitizer, etc., inputs an alphabetic character, a graphic form, etc., and creates the line drawing data 4.

[0013] Edit equipment 250 receives the line drawing processor 220 to reception and the line drawing data 4 for the pattern data 3 from the image input scanner 210. And according to reception and its directions, the pattern data 3 and the line drawing data 4 are edited for the directions from operators, such as layout information, from the actuation input unit 230, and the image data of a page unit is created. After edit of a page unit is completed, according to the specification of bookbinding etc., two or more pages are arranged on one printing side, and the field attachment data 5 are created. A line drawing field is created by the alphabetic character and graphic form vector data, and a pattern field is created for this field attachment data 5 by image concentration data.

[0014] RIP260 is carrying out vector expansion to a line drawing field, and creates the bit map data 6 corresponding to each printing version whose color was separated while it adds shading to the field attachment data 5 from edit equipment 250 to reception and a pattern field. The bit map data 6 consist of binary data of the value of "0" in which "1" which divided all the printing sides of the printing version 1 according to the open photolysis ability of the printing version listing device 100 mentioned later, and which shows the streak section for every dot, and the non-streak section are shown.

[0015] As mentioned above, an image processing system 200 creates and outputs the bit map data 6 for every printing version by which two or more pages including a pattern field or a line drawing field have been arranged. Next, the printing version listing device 100 is explained. As shown in drawing 1, the printing version listing device 100 The exposure section 10 which exposes a plate 13 directly and creates the printing version, and the scan control section 30 which controls the exposure scan of the exposure section 10, The image control section 40 which controls the output of

reception and the exposure head 15 for the bit map data 6 from RIP260, The streak field calculation section 50 which computes the field of the streak section based on the bit map data 6 from RIP260, It has the rate operation part 60 of area which computes the rate of area (the amount data of ink) of the streak field of each division field (inspection zone) of every from the data of the streak field computed in the streak field calculation section 50, CPU70 which controls actuation of each processing section, memory 80, and the actuation input section 90 and the data output section 95.

[0016] The drum 11 which the exposure section 10 twists the plate 13 constituted by putting a sensitization layer etc. on the front face of version materials, such as aluminum, and rotates by the horizontal-scanning motor 12 further, The rotary encoder 14 which detects the rotation of a drum 11, and a rate, and the exposure head 15 which irradiates an exposure beam on the front face of a plate 13 according to exposure data, and exposes the front face of a plate 13 directly, It has the feed screw 16 for moving the exposure head 15 in the direction Y of vertical scanning, and the vertical-scanning motor 17 for rotating a feed screw 16.

[0017] The scan control section 30 controls rotation actuation of the horizontal-scanning motor 12, and controls exposure actuation of the main scanning direction X of the plate 13 on a drum 11, and controls rotation actuation of the vertical-scanning motor 17, and controls migration in the direction Y of vertical scanning of the exposure head 15. Further, the streak field calculation section 50 includes the latch 56 with the 1st counter 51, the 2nd counter 52, the 3rd counter 53, the register 54, and the comparator 55, and mentions later about actuation of each part. Next, actuation of the printing version listing device 100 by this example is explained. This printing version listing device 100 combines the printing version creation function which exposes the front face of a plate 13 and creates the printing version directly, and the amount data calculation function of ink which computes the amount data of ink. And the amount data calculation processing of ink is performed in parallel to the printing version creation processing and coincidence using the bit map data used for the printing version creation processing. Therefore, first, actuation of the printing version creation processing is explained and actuation of the amount calculation processing of ink is explained after that.

(The printing version creation processing)

(1) If directions of exposure initiation are given by the operator with reference to drawing 1, the scan control section 30 will output the drum driving pulse P1 to the horizontal-scanning motor 12, and will start rotation of a drum 11. Criteria timing signal LS (refer to drawing 6) of exposure of a main scanning direction X is generated in coincidence, and it outputs to it at RIP260. In addition, this criteria timing signal LS is generated for every rotation of a drum 11.

(2) The image control section 40 reads the bit map data 6 from RIP260 for every line synchronizing with criteria timing signal LS. Moreover, generate clock signal DC (refer to drawing 7) for taking the timing of the output of exposure data, it is made to synchronize with the timing of this clock signal DC, the bit map data 6 are changed into the output data of the exposure head 15 by bitwise, and it outputs to the exposure head 15. For example, in the case of "0" generate the exposure data of output "ON" of the exposure head 15 in the case of "1" the bit map data 6 indicate the streak section to be, and the bit map data 6 indicate the non-streak section to be to it, the non-exposing data of output "OFF" are generated and outputted. According to these output data, the exposure head 15 irradiates an exposure beam on plate 13 front face, and exposure processing in every line to a main scanning direction X is performed.

(3) The scan control section 30 supervises whether reception and the scan for one line (one rotation of a drum 11) of a main scanning direction X ended the rotation of the drum 11 which a rotary encoder 14 detects. If termination of the scan for one line is detected, a driving pulse P2 will be outputted to the vertical-scanning motor 17, a feed screw 16 will be rotated, and the exposure head 15 will be moved in the direction Y of vertical scanning by 1 dot. And the scan control section 30 generates criteria timing signal LS again, reads the following bit map data 6 for one line from RIP260 to the image control section 40, and performs the same exposure processing as the above.

(4) Cover the whole (all Rhine) exposure field of a plate 13, perform the above processing, and create the printing version 1.

(The amount data calculation processing of ink) First, a setup of the division field (inspection zone) for asking for the amount data of ink is explained. Drawing 4 shows typically the relation between the scanning direction of the exposure beam of the printing version listing device 100 to a plate 13 (main-scanning-direction size XL: the direction YL of vertical scanning), and the printing direction in a printing machine. The main scanning direction X of the exposure to a plate 13 and the printing direction P in a printing machine are not necessarily matches by the class of printing machine. For example, drawing 4 (a) has illustrated the case where the main scanning direction X and printing direction P of drawing 4 (b) correspond, when the main scanning direction X in the printing version listing device 100 differs from the printing direction P in a printing machine.

[0018] When both differ, as shown in drawing of the lower berth of drawing 4 (a), the size x1 of the main scanning direction of the division field 8 is divided and set up by the number of partitions into which the main scanning direction size XL of a plate 13 was inputted by the operator. This number of partitions is the number of the ink zones 7 specified

in the array of a fountain 300. Moreover, this division field 8 serves as a band-like long rectangle in the direction Y of vertical scanning. Hereafter, this setting method is called a main scanning direction division method.

[0019] Moreover, when both are in agreement, the size y_2 of the direction of vertical scanning of the division field 8 is divided and set up by the number of partitions into which the direction size Y_L of vertical scanning of a plate 13 was inputted by the operator so that it may be illustrated by the lower berth of drawing 4 (b). It is the number of the ink zones 7 like [this number of partitions] ****. The division field 8 in this case serves as a band-like long rectangle in a main scanning direction X. Hereafter, this setting method is called the direction division method of vertical scanning.

[0020] Drawing 5 and drawing 6 are flow charts which show the amount data calculation processing of ink, and drawing 7 shows the timing chart of each signal used for the amount data calculation processing of ink. Hereafter, it explains with reference to drawing 5, drawing 6, and drawing 7. In drawing 5, an operator first inputs the division direction (the main scanning direction X or the direction Y of vertical scanning) and the number of partitions (in n , the case of drawing 4 $n=4$) for setting up the division field 8 set from the actuation input section 90 as the calculation object of the amount data of ink (step S10).

[0021] If it will be judged as a main scanning direction division method, and it will shift to step S20, if the inputted division direction is a main scanning direction X, and the direction Y of vertical scanning is inputted, it will be judged as the direction division method of vertical scanning, and will shift to processing of step S30 (drawing 6) (step S11).

(Main scanning direction division method) If a main scanning direction X is inputted as a division direction, in step S20, the number (TD/n) of division dots divided by the number of partitions n into which the total number TD of dots of the main scanning direction X of a plate 13 was inputted is stored in a register 54 as main scanning direction size x_1 of the division field 8. Moreover, in step S21, the total number TL of Rhine which becomes settled from the direction size Y_L of vertical scanning and open photolysis ability of a plate 13 is recognized and registered within CPU70.

[0022] Furthermore, memory 80 is cleared at step S22. Next, exposure processing will be started if an operator gives directions of exposure processing from the actuation input section 90 (step S23). The scan control section 30 generates criteria timing signal LS which specifies the timing of exposure initiation of a main scanning direction X, and is outputted to RIP260 and the streak field calculation section 50. RIP260 outputs the bit map data 6 in every line to the image control section 40 synchronizing with criteria timing signal LS . The bit map data 6 are set as the value of "0" in "1" and the non-streak section by the streak section. And the image control section 40 generates clock signal DC which specifies the output timing of exposure or not exposing, changes the bit map data 6 into the output data for sequential exposure synchronizing with clock signal DC , and outputs them to the exposure head 15.

[0023] Coincidence is made to generate the exposure data detecting signal DD at this time when the bit map data 6 are "1." As shown in drawing 7, as timing of count initiation of criteria timing signal LS , the 1st counter 51 counts the number DCN of clocks of clock signal DC inputted, and the 2nd counter 52 counts the count of generating of the exposure data detecting signal DD (the numbers D_i and j of exposure data) (step S24). In addition, exposure data D_i and j It sets, means the division field of what position i is, and means Rhine of what position j is.

[0024] A comparator 55 compares the counted value DCN of clock signal DC read from the 1st counter 51 with the number of division dots (TD/n) beforehand stored in the register 54 (step S25). And when the counted value DCN of the 1st counter 51 is smaller than the number (TD/n) of division dots, processing of step S24 is continued. Moreover, the numbers D_i and j of exposure data which the comparator 55 outputted the notice signal ES of count termination, and counted with the 2nd counter 52 by this when the number of both became the same While saving at latch 56, the 1st counter 51 and the 2nd counter 52 are cleared (step S26). At this time, the notice signal ES of count termination is given also to CPU70. In addition, the 1st and 2nd counters 51 and 52 are cleared by criteria timing signal LS in every line.

[0025] If the notice ES of count termination is received, CPU70 will read the value saved at the latch 56. And CPU70 is the numbers D_i and j of exposure data newly saved at the latch 56. Exposure data D_i and j which read the already stored computed data and were saved at the latch 56 from the storing field of the memory 80 corresponding to the computed division field 8 The computed data read from memory 80 are added, and it stores in the storing field of the memory 80 which corresponds again (step S27).

[0026] Moreover, the 3rd counter 53 has counted the number LN of criteria timing signal LS generated for every line of horizontal scanning. That is, current and exposure processing have counted exposure [a main scanning direction] of the how many lines is performed, and CPU70 is supervising this. If the 3rd counter 53 has not counted the following criteria timing signal LS in the case of processing of the above-mentioned step S27, it judges that the processing of one line has not ended CPU70 (step S28), and the data obtained from the above-mentioned step S24 by performing even step S27 repeatedly are stored in memory 80.

[0027] An example of the storing field of memory 80 is shown in drawing 8 (a). For example, when exposure

processing of a main scanning direction X is performed about the 2nd line of the 1st division field 81 (refer to drawing 4 (a)), in latch 56, they are the 1 and 2 exposure data D of the 2nd line. It is saved. storing field m1 where memory 80 corresponds at this time **** -- exposure data 1 and D 1 of the 1st line of the same division field 81 It is already stored. and data 1 and D 2 which read CPU70 from the latch 56 Storing field m1 of memory 80 from -- the read data 1 and D 1 -- adding -- the data after addition -- the same storing field m1 of memory 80 It stores (step S27).

[0028] In step S28, termination of the above-mentioned processing of one line judges whether processing of all Rhine was completed in step S29. This decision is performed when CPU70 compares with the counted value LN of the 3rd counter 53 the total number TL of Rhine registered at step S21. That is, if it judges that processing of all Rhine is not completed in $LN < TL$, processing from the above-mentioned step S24 to step S28 is repeated and it becomes $LN = TL$, it will move to calculation (after-mentioned) of the rate of streak partial area (the amount data of ink).

[0029] (The direction division method of vertical scanning) If the division direction inputted at step S10 is judged to be the direction Y of vertical scanning again (step S11), in step S30 (refer to drawing 6), the total number TD of dots of a main scanning direction X is stored in a register 54. Moreover, in step S31, the number (TL/n) of division Rhine divided by the number of partitions n into which the total number TL of Rhine was inputted is recognized as direction size y2 of vertical scanning of the division field 8, and CPU70 registers it. Furthermore, memory 80 is cleared at step S32.

[0030] Next, if an operator gives directions of exposure processing from the actuation input section 90, will start exposure processing (step S33) and it will set to step S34 as well as the above-mentioned step S24. As timing of count initiation of criteria timing signal LS, the 1st counter 51 The number DCN of clocks of clock signal DC inputted is counted, and, as for the 2nd counter 52, bit map data count the count of generating of the exposure data detecting signal DD of "1" (exposure data Di and j) (step S34).

[0031] A comparator 55 compares the total number TD of dots beforehand stored in the counted value DCN read from the 1st counter 51, and a register 54 (step S35). And processing is continued when the counted value DCN of the 1st counter 51 is smaller than the total number TD of dots. Moreover, exposure data Di and j which the comparator 55 outputted the notice signal ES of count termination, and counted with the 2nd counter 52 by this when the number of both became the same While saving at latch 56, the 1st counter 51 and the 2nd counter 52 are cleared (step S36). At this time, the notice signal ES of count termination is given also to CPU70. The notice signal ES of counter termination in this case also means one-line termination.

[0032] If the notice ES of count termination is received, CPUs70 are the exposure data Di and j newly saved at the latch 56. It reads. And CPUs70 are the exposure data Di and j saved at the latch 56. From the storing field of the memory 80 corresponding to the computed division field 8 New calculation exposure data Di and j which read the already stored computed data and were saved at the latch 56 The computed data read from memory 80 are added, and it stores in the storing field of the corresponding memory 80 again (step S37).

[0033] An example of the storing field of memory 80 is shown in drawing 8 (b). For example, when exposure processing of a main scanning direction X is performed about the 2nd line of the 1st division field 81 (refer to drawing 4 (b)), in latch 56, they are the 1 and 2 exposure data D of the 2nd line. It is stored. storing field m1 where memory 80 corresponds at this time **** -- 1 and 1 exposure data D of the 1st line of the same division field 81 It is already stored. And it is the data 1 and D 2 which read CPU70 from the latch 56. Data 1 and D 1 read from the storing field m1 of memory 80 It adds and is the same storing field m1 of memory 80 about the data after addition. It stores (step S37).

[0034] Moreover, CPU70 judges whether as compared with the number (TL/n) of division Rhine, processing of every division field 8 and the number (TL/n) of division Rhine ended the counted value LN of the 3rd counter 53 (step S38). Next, CPU70 judges whether as compared with the total number TL of Rhine, processing of all Rhine ended the counted value LN of the 3rd counter 53 (step S39).

[0035] After data calculation of the plate 13 whole is completed (steps S29 and S39), the rate operation part 60 of area reads the counted value (exposure data) of the streak part called for every division field 81-84 from each storing field m1-m4 of memory 80. And the rate of area of a streak part or the rate of area of a non-streak part is computed by the following formulas (step S40).

[0036] Rate of streak partial area = Unit pixel area x Streak section counted value / Rate of division field area non-streak partial area = 1 - The area for 1 dot as which unit pixel area is specified with the resolution of the exposure section 10 which is a rate of streak partial area is shown. The rate data of area of the computed streak part are outputted from the data output section 95 as amount data of ink (step S41).

[0037] This rate data of area is memorized by the storage of the data output section 95, and is handed over by the printing machine off-line or on-line. A printing machine sets up the opening of the ink feed hopper of the fountain corresponding to the rate data of area for every division field virtually set as the printing side of the printing version.

Rationalization of the ink amount of supply can be attained by decreasing the amount of supply of ink in few printing fields of an image field, and making the amount of supply of ink increase to the large printing field of an image field by this.

[0038] In addition, it constituted so that the number of exposure data of value "1" of the bit map data corresponding to a streak part might be counted, but the streak field calculation section 50 may consist of above-mentioned examples so that the number of non-exposing data of value "0" of a non-streak part may be counted. Furthermore, in the above-mentioned example, although the example using the structure of a cylinder external surface scanning-type was shown in the exposure section 10, it is not limited to this and the structure cylinder inside scanning and flat-surface scanning may be applied.

[0039]

[Effect of the Invention] Thus, the printing version listing device by this invention While exposing the front face of a plate for the bit map data containing a pattern part and a line drawing part directly using reception and this and creating the printing version Since it is constituted so that the amount data of ink of a printing field or a non-printed field may be computed based on bit map data for every inspection zone which divided and set up the plate front face The time and effort which does the calculation activity of the amount data of ink anew can be omitted after the printing version creation, and the working efficiency of platemaking and presswork can be raised.

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TECHNICAL FIELD

[Industrial Application] This invention relates to the printing version listing device in which creation of the printing version and calculation of the amount data of ink used for coincidence by presswork are possible especially about the printing version listing device used for a platemaking process.

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PRIOR ART

[Description of the Prior Art] Usually, printed matter sets to a printing machine the printing version created by the platemaking process, supplies ink to the printing side, and is imprinted and created by the form etc. Drawing 9 shows typically the relation of the printing version and the ink feeder of a printing machine in presswork. The printing machine has two or more fountains 300 arranged at the predetermined spacing crosswise [of the printing version 1] (drawing 9 longitudinal direction), and the ink supplied from a fountain 300 is supplied to the front face of the printing version 1 via various rollers. Accommodation of the amount of ink is attained every fountain 300 by adjusting the opening of a fountain 300, and the ink supplied from one fountain 300 is supplied to the ink zone 7 virtually divided on the printing version 1 front face corresponding to each of a fountain 300.

[0003] Since the printing field, the non-printed field or the field where an image consistency is large, the small field, etc. are intermingled, as for the printing side corresponding to the ink zone 7, it is desirable to adjust the amount of ink which should be supplied every ink zone 7. For this reason, the printing front face of the created printing version 1 is conventionally measured using the reader of dedication, it asks for the amount data of ink for every ink zone 7 from the area of the image part of the printing version 1, and the opening of a fountain 300 is adjusted according to this amount data of ink (JP,59-71863,A).

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EFFECT OF THE INVENTION

[Effect of the Invention] Thus, the printing version listing device by this invention While exposing the front face of a plate for the bit map data containing a pattern part and a line drawing part directly using reception and this and creating the printing version Since it is constituted so that the amount data of ink of a printing field or a non-printed field may be computed based on bit map data for every inspection zone which divided and set up the plate front face The time and effort which does the calculation activity of the amount data of ink anew can be omitted after the printing version creation, and the working efficiency of platemaking and presswork can be raised.

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] However, the method of reading an image field in the created printing version directly, and asking for the amount data of ink needed the reader of dedication, and the amount data calculation activity of ink, and the processing was complicated for the operator. On the other hand, in case JP,4-12227,B separates the color of a photograph manuscript in the platemaking process over a photograph manuscript and creates the halftone dot film for every color version, it is indicating the approach of computing the amount data of ink used for adjustment of the fountain of a printing machine using color-separation image (pattern) data. However, by this approach, the amount data of ink are computed for every subsection field which divided and set further the printing field 9 of the page unit shown in drawing 9 as a large number. For this reason, to the printing version 1 with which two or more page fields 9 have been arranged, with reference to the amount data of ink computed by this approach about each page field 9, the area of null parts other than page field 9 also had to be taken into consideration, and the operator had to compute the amount data of ink for every ink zone 7 of the printing version 1 anew. Moreover, in JP,4-12227,B, since it was not contained in a processing object about line drawing data, such as an alphabetic character and a graphic form, about the printing version with which line drawing data are contained, separately, the operator had to compute the amount of ink, and had to compound and compute the amount data of ink for every fountain.

[0005] Therefore, this invention was made in order to cancel the above troubles, and it aims at offering the printing version listing device which can compute the amount data of ink for every fountain installed to the printing version using the image data of a platemaking process.

[Translation done.]

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MEANS

[Means for Solving the Problem] While exposing the front face of said plate directly using the bit map data of the field which the printing version listing device concerning invention of claim 1 corresponds to the whole printing side of a plate, and contains a pattern part and a line drawing part and creating the printing version An inspection zone setting means to compute the amount data of ink needed by presswork, to divide the printing side of a plate, and to set up an inspection zone, Either the number of exposure data or the number of non-exposing data was integrated out of the bit map data corresponding to an inspection zone, and it has a data addition means to compute the addition data for every inspection zone, and an amount data calculation means of ink to compute the amount data of ink based on the addition data for every inspection zone.

[0007] In the printing version listing device concerning invention of claim 2, an inspection zone setting means sets up an inspection zone so that it may become the rectangle field which has the die length to which ink is supplied from one fountain of the printing machine which one side uses by presswork.

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OPERATION

[Function] The printing version listing device of this invention receives as an input the bit map data of the field which corresponds to the whole printing side of a plate, and contains a pattern part and a line drawing part. And the front face of a plate is exposed directly and the printing version is created. Moreover, the amount data of ink needed by next presswork are computed by using bit map data for coincidence. For this reason, first, an inspection zone setting means divides the printing side of a plate, and sets up an inspection zone. And a data addition means integrates either the number of exposure data, or the number of non-exposing data out of the bit map data corresponding to an inspection zone, and computes the addition data for every inspection zone. Furthermore, the amount calculation means of ink computes the amount data of ink based on the addition data for every inspection zone.

[0009] Moreover, in the printing version listing device of invention of claim 2, an inspection zone setting means sets up an inspection zone so that it may become the rectangle field which has the die length to which ink is supplied from one fountain of the printing machine which one side uses by presswork.

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EXAMPLE

[Example] Hereafter, the example of this invention is explained to a detail using drawing. Drawing 1 is the block diagram showing the configuration of the printing version listing device by the example of this invention, and drawing 2 is the block diagram having shown typically the whole platemaking system configuration containing this printing version listing device. This platemaking system is constituted from online or a printing version listing device 100 by which off-line connection is made by an image processing system 200 and this.

[0011] First, the outline of the configuration of an image processing system 200 and processing is explained. An image processing system 200 is equipped with the image input scanner 210, the line drawing processor 220, the actuation input devices 230, such as a keyboard and graphic display, the store 240 that memorizes image data, edit equipment 250, and RIP (raster image processor)260 with reference to drawing 2 .

[0012] Drawing 3 shows the flow of processing of each equipment in a platemaking system based on changes of data. Hereafter, with reference to drawing 2 and drawing 3 , the outline of processing of an image processing system 200 is explained. The image input scanner 210 reads the photograph manuscript 2, performs color-separation processing, and creates the pattern data 3 of each color (Y, M, C, K) of every per manuscript. Moreover, the line drawing processor 220 consists of a computerized-type-setting machine, a digitizer, etc., inputs an alphabetic character, a graphic form, etc., and creates the line drawing data 4.

[0013] Edit equipment 250 receives the line drawing processor 220 to reception and the line drawing data 4 for the pattern data 3 from the image input scanner 210. And according to reception and its directions, the pattern data 3 and the line drawing data 4 are edited for the directions from operators, such as layout information, from the actuation input unit 230, and the image data of a page unit is created. After edit of a page unit is completed, according to the specification of bookbinding etc., two or more pages are arranged on one printing side, and the field attachment data 5 are created. A line drawing field is created by the alphabetic character and graphic form vector data, and a pattern field is created for this field attachment data 5 by image concentration data.

[0014] RIP260 is carrying out vector expansion to a line drawing field, and creates the bit map data 6 corresponding to each printing version whose color was separated while it adds shading to the field attachment data 5 from edit equipment 250 to reception and a pattern field. The bit map data 6 consist of binary data of the value of "0" in which "1" which divided all the printing sides of the printing version 1 according to the open photolysis ability of the printing version listing device 100 mentioned later, and which shows the streak section for every dot, and the non-streak section are shown.

[0015] As mentioned above, an image processing system 200 creates and outputs the bit map data 6 for every printing version by which two or more pages including a pattern field or a line drawing field have been arranged. Next, the printing version listing device 100 is explained. As shown in drawing 1 , the printing version listing device 100 The exposure section 10 which exposes a plate 13 directly and creates the printing version, and the scan control section 30 which controls the exposure scan of the exposure section 10, The image control section 40 which controls the output of reception and the exposure head 15 for the bit map data 6 from RIP260, The streak field calculation section 50 which computes the field of the streak section based on the bit map data 6 from RIP260, It has the rate operation part 60 of area which computes the rate of area (the amount data of ink) of the streak field of each division field (inspection zone) of every from the data of the streak field computed in the streak field calculation section 50, CPU70 which controls actuation of each processing section, memory 80, and the actuation input section 90 and the data output section 95.

[0016] The drum 11 which the exposure section 10 twists the plate 13 constituted by putting a sensitization layer etc. on the front face of version materials, such as aluminum, and rotates by the horizontal-scanning motor 12 further, The rotary encoder 14 which detects the rotation of a drum 11, and a rate, and the exposure head 15 which irradiates an exposure beam on the front face of a plate 13 according to exposure data, and exposes the front face of a plate 13

directly, It has the feed screw 16 for moving the exposure head 15 in the direction Y of vertical scanning, and the vertical-scanning motor 17 for rotating a feed screw 16.

[0017] The scan control section 30 controls rotation actuation of the horizontal-scanning motor 12, and controls exposure actuation of the main scanning direction X of the plate 13 on a drum 11, and controls rotation actuation of the vertical-scanning motor 17, and controls migration in the direction Y of vertical scanning of the exposure head 15. Further, the streak field calculation section 50 includes the latch 56 with the 1st counter 51, the 2nd counter 52, the 3rd counter 53, the register 54, and the comparator 55, and mentions later about actuation of each part. Next, actuation of the printing version listing device 100 by this example is explained. This printing version listing device 100 combines the printing version creation function which exposes the front face of a plate 13 and creates the printing version directly, and the amount data calculation function of ink which computes the amount data of ink. And the amount data calculation processing of ink is performed in parallel to the printing version creation processing and coincidence using the bit map data used for the printing version creation processing. Therefore, first, actuation of the printing version creation processing is explained and actuation of the amount calculation processing of ink is explained after that.

(The printing version creation processing)

- (1) If directions of exposure initiation are given by the operator with reference to drawing 1, the scan control section 30 will output the drum driving pulse P1 to the horizontal-scanning motor 12, and will start rotation of a drum 11. Criteria timing signal LS (refer to drawing 6) of exposure of a main scanning direction X is generated in coincidence, and it outputs to it at RIP260. In addition, this criteria timing signal LS is generated for every rotation of a drum 11.
- (2) The image control section 40 reads the bit map data 6 from RIP260 for every line synchronizing with criteria timing signal LS. Moreover, generate clock signal DC (refer to drawing 7) for taking the timing of the output of exposure data, it is made to synchronize with the timing of this clock signal DC, the bit map data 6 are changed into the output data of the exposure head 15 by bitwise, and it outputs to the exposure head 15. For example, in the case of "0" generate the exposure data of output "ON" of the exposure head 15 in the case of "1" the bit map data 6 indicate the streak section to be, and the bit map data 6 indicate the non-streak section to be to it, the non-exposing data of output "OFF" are generated and outputted. According to these output data, the exposure head 15 irradiates an exposure beam on plate 13 front face, and exposure processing in every line to a main scanning direction X is performed.
- (3) The scan control section 30 supervises whether reception and the scan for one line (one rotation of a drum 11) of a main scanning direction X ended the rotation of the drum 11 which a rotary encoder 14 detects. If termination of the scan for one line is detected, a driving pulse P2 will be outputted to the vertical-scanning motor 17, a feed screw 16 will be rotated, and the exposure head 15 will be moved in the direction Y of vertical scanning by 1 dot. And the scan control section 30 generates criteria timing signal LS again, reads the following bit map data 6 for one line from RIP260 to the image control section 40, and performs the same exposure processing as the above.
- (4) Cover the whole (all Rhine) exposure field of a plate 13, perform the above processing, and create the printing version 1.

(The amount data calculation processing of ink) First, a setup of the division field (inspection zone) for asking for the amount data of ink is explained. Drawing 4 shows typically the relation between the scanning direction of the exposure beam of the printing version listing device 100 to a plate 13 (main-scanning-direction size XL: the direction YL of vertical scanning), and the printing direction in a printing machine. The main scanning direction X of the exposure to a plate 13 and the printing direction P in a printing machine are not necessarily matches by the class of printing machine. For example, drawing 4 (a) has illustrated the case where the main scanning direction X and printing direction P of drawing 4 (b) correspond, when the main scanning direction X in the printing version listing device 100 differs from the printing direction P in a printing machine.

[0018] When both differ, as shown in drawing of the lower berth of drawing 4 (a), the size x1 of the main scanning direction of the division field 8 is divided and set up by the number of partitions into which the main scanning direction size XL of a plate 13 was inputted by the operator. This number of partitions is the number of the ink zones 7 specified in the array of a fountain 300. Moreover, this division field 8 serves as a band-like long rectangle in the direction Y of vertical scanning. Hereafter, this setting method is called a main scanning direction division method.

[0019] Moreover, when both are in agreement, the size y2 of the direction of vertical scanning of the division field 8 is divided and set up by the number of partitions into which the direction size YL of vertical scanning of a plate 13 was inputted by the operator so that it may be illustrated by the lower berth of drawing 4 (b). It is the number of the ink zones 7 like [this number of partitions] ****. The division field 8 in this case serves as a band-like long rectangle in a main scanning direction X. Hereafter, this setting method is called the direction division method of vertical scanning.

[0020] Drawing 5 and drawing 6 are flow charts which show the amount data calculation processing of ink, and drawing 7 shows the timing chart of each signal used for the amount data calculation processing of ink. Hereafter, it

explains with reference to drawing 5 , drawing 6 , and drawing 7 . In drawing 5 , an operator first inputs the division direction (the main scanning direction X or the direction Y of vertical scanning) and the number of partitions (in n , the case of drawing 4 $n=4$) for setting up the division field 8 set from the actuation input section 90 as the calculation object of the amount data of ink (step S10).

[0021] If it will be judged as a main scanning direction division method, and it will shift to step S20, if the inputted division direction is a main scanning direction X, and the direction Y of vertical scanning is inputted, it will be judged as the direction division method of vertical scanning, and will shift to processing of step S30 (drawing 6) (step S11). (Main scanning direction division method) If a main scanning direction X is inputted as a division direction, in step S20, the number (TD/n) of division dots divided by the number of partitions n into which the total number TD of dots of the main scanning direction X of a plate 13 was inputted is stored in a register 54 as main scanning direction size $x1$ of the division field 8. Moreover, in step S21, the total number TL of Rhine which becomes settled from the direction size YL of vertical scanning and open photolysis ability of a plate 13 is recognized and registered within CPU70.

[0022] Furthermore, memory 80 is cleared at step S22. Next, exposure processing will be started if an operator gives directions of exposure processing from the actuation input section 90 (step S23). The scan control section 30 generates criteria timing signal LS which specifies the timing of exposure initiation of a main scanning direction X, and is outputted to RIP260 and the streak field calculation section 50. RIP260 outputs the bit map data 6 in every line to the image control section 40 synchronizing with criteria timing signal LS . The bit map data 6 are set as the value of "0" in "1" and the non-streak section by the streak section. And the image control section 40 generates clock signal DC which specifies the output timing of exposure or not exposing, changes the bit map data 6 into the output data for sequential exposure synchronizing with clock signal DC , and outputs them to the exposure head 15.

[0023] Coincidence is made to generate the exposure data detecting signal DD at this time when the bit map data 6 are "1." As shown in drawing 7 , as timing of count initiation of criteria timing signal LS , the 1st counter 51 counts the number DCN of clocks of clock signal DC inputted, and the 2nd counter 52 counts the count of generating of the exposure data detecting signal DD (the numbers Di and j of exposure data) (step S24). In addition, exposure data Di and j it sets, means the division field of what position i is, and means Rhine of what position j is.

[0024] A comparator 55 compares the counted value DCN of clock signal DC read from the 1st counter 51 with the number of division dots (TD/n) beforehand stored in the register 54 (step S25). And when the counted value DCN of the 1st counter 51 is smaller than the number (TD/n) of division dots, processing of step S24 is continued. Moreover, the numbers Di and j of exposure data which the comparator 55 outputted the notice signal ES of count termination, and counted with the 2nd counter 52 by this when the number of both became the same While saving at latch 56, the 1st counter 51 and the 2nd counter 52 are cleared (step S26). At this time, the notice signal ES of count termination is given also to CPU70. In addition, the 1st and 2nd counters 51 and 52 are cleared by criteria timing signal LS in every line.

[0025] If the notice ES of count termination is received, CPU70 will read the value saved at the latch 56. And CPU70 is the numbers Di and j of exposure data newly saved at the latch 56. Exposure data Di and j which read the already stored computed data and were saved at the latch 56 from the storing field of the memory 80 corresponding to the computed division field 8 The computed data read from memory 80 are added, and it stores in the storing field of the memory 80 which corresponds again (step S27).

[0026] Moreover, the 3rd counter 53 has counted the number LN of criteria timing signal LS generated for every line of horizontal scanning. That is, current and exposure processing have counted exposure [a main scanning direction] of the how many lines is performed, and CPU70 is supervising this. If the 3rd counter 53 has not counted the following criteria timing signal LS in the case of processing of the above-mentioned step S27, it judges that the processing of one line has not ended CPU70 (step S28), and the data obtained from the above-mentioned step S24 by performing even step S27 repeatedly are stored in memory 80.

[0027] An example of the storing field of memory 80 is shown in drawing 8 (a). For example, when exposure processing of a main scanning direction X is performed about the 2nd line of the 1st division field 81 (refer to drawing 4 (a)), in latch 56, they are the 1 and 2 exposure data D of the 2nd line. It is saved. storing field $m1$ where memory 80 corresponds at this time **** -- exposure data 1 and $D1$ of the 1st line of the same division field 81 It is already stored. and data 1 and $D2$ which read CPU70 from the latch 56 Storing field $m1$ of memory 80 from -- the read data 1 and $D1$ -- adding -- the data after addition -- the same storing field $m1$ of memory 80 It stores (step S27).

[0028] In step S28, termination of the above-mentioned processing of one line judges whether processing of all Rhine was completed in step S29. This decision is performed when CPU70 compares with the counted value LN of the 3rd counter 53 the total number TL of Rhine registered at step S21. That is, if it judges that processing of all Rhine is not completed in $LN < TL$, processing from the above-mentioned step S24 to step S28 is repeated and it becomes $LN=TL$, it

will move to calculation (after-mentioned) of the rate of streak partial area (the amount data of ink).

[0029] (The direction division method of vertical scanning) If the division direction inputted at step S10 is judged to be the direction Y of vertical scanning again (step S11), in step S30 (refer to drawing 6), the total number TD of dots of a main scanning direction X is stored in a register 54. Moreover, in step S31, the number (TL/n) of division Rhine divided by the number of partitions n into which the total number TL of Rhine was inputted is recognized as direction size y2 of vertical scanning of the division field 8, and CPU70 registers it. Furthermore, memory 80 is cleared at step S32.

[0030] Next, if an operator gives directions of exposure processing from the actuation input section 90, will start exposure processing (step S33) and it will set to step S34 as well as the above-mentioned step S24. As timing of count initiation of criteria timing signal LS, the 1st counter 51 The number DCN of clocks of clock signal DC inputted is counted, and, as for the 2nd counter 52, bit map data count the count of generating of the exposure data detecting signal DD of "1" (exposure data Di and j) (step S34).

[0031] A comparator 55 compares the total number TD of dots beforehand stored in the counted value DCN read from the 1st counter 51, and a register 54 (step S35). And processing is continued when the counted value DCN of the 1st counter 51 is smaller than the total number TD of dots. Moreover, exposure data Di and j which the comparator 55 outputted the notice signal ES of count termination, and counted with the 2nd counter 52 by this when the number of both became the same While saving at latch 56, the 1st counter 51 and the 2nd counter 52 are cleared (step S36). At this time, the notice signal ES of count termination is given also to CPU70. The notice signal ES of counter termination in this case also means one-line termination.

[0032] If the notice ES of count termination is received, CPUs70 are the exposure data Di and j newly saved at the latch 56. It reads. And CPUs70 are the exposure data Di and j saved at the latch 56. From the storing field of the memory 80 corresponding to the computed division field 8 New calculation exposure data Di and j which read the already stored computed data and were saved at the latch 56 The computed data read from memory 80 are added, and it stores in the storing field of the corresponding memory 80 again (step S37).

[0033] An example of the storing field of memory 80 is shown in drawing 8 (b). For example, when exposure processing of a main scanning direction X is performed about the 2nd line of the 1st division field 81 (refer to drawing 4 (b)), in latch 56, they are the 1 and 2 exposure data D of the 2nd line. It is stored. storing field m1 where memory 80 corresponds at this time **** -- 1 and 1 exposure data D of the 1st line of the same division field 81 It is already stored. And it is the data 1 and D 2 which read CPU70 from the latch 56. Data 1 and D 1 read from the storing field m1 of memory 80 It adds and is the same storing field m1 of memory 80 about the data after addition. It stores (step S37).

[0034] Moreover, CPU70 judges whether as compared with the number (TL/n) of division Rhine, processing of every division field 8 and the number (TL/n) of division Rhine ended the counted value LN of the 3rd counter 53 (step S38). Next, CPU70 judges whether as compared with the total number TL of Rhine, processing of all Rhine ended the counted value LN of the 3rd counter 53 (step S39).

[0035] After data calculation of the plate 13 whole is completed (steps S29 and S39), the rate operation part 60 of area reads the counted value (exposure data) of the streak part called for every division field 81-84 from each storing field m1-m4 of memory 80. And the rate of area of a streak part or the rate of area of a non-streak part is computed by the following formulas (step S40).

[0036] Rate of streak partial area = Unit pixel area x Streak section counted value / Rate of division field area non-streak partial area = 1 - The area for 1 dot as which unit pixel area is specified with the resolution of the exposure section 10 which is a rate of streak partial area is shown. The rate data of area of the computed streak part are outputted from the data output section 95 as amount data of ink (step S41).

[0037] This rate data of area is memorized by the storage of the data output section 95, and is handed over by the printing machine off-line or on-line. A printing machine sets up the opening of the ink feed hopper of the fountain corresponding to the rate data of area for every division field virtually set as the printing side of the printing version. Rationalization of the ink amount of supply can be attained by decreasing the amount of supply of ink in few printing fields of an image field, and making the amount of supply of ink increase to the large printing field of an image field by this.

[0038] In addition, it constituted so that the number of exposure data of value "1" of the bit map data corresponding to a streak part might be counted, but the streak field calculation section 50 may consist of above-mentioned examples so that the number of non-exposing data of value "0" of a non-streak part may be counted. Furthermore, in the above-mentioned example, although the example using the structure of a cylinder external surface scanning-type was shown in the exposure section 10, it is not limited to this and the structure cylinder inside scanning and flat-surface scanning may be applied.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is the block diagram showing the configuration of the printing version listing device by the example of this invention.

[Drawing 2] It is the block diagram having shown typically the platemaking structure of a system containing the printing version listing device of this invention.

[Drawing 3] It is the explanatory view having shown notionally changes of the data in the platemaking system shown in drawing 2.

[Drawing 4] It is an explanatory view for explaining the setting approach of a division field.

[Drawing 5] It is the flow chart which shows actuation of the amount data calculation processing of ink of the printing version listing device shown in drawing 1.

[Drawing 6] It is the flow chart which shows actuation of the amount data calculation processing of ink of the printing version listing device shown in drawing 1.

[Drawing 7] It is the timing chart which shows the timing of the various signals in the amount data calculation processing of ink of the printing version listing device shown in drawing 1.

[Drawing 8] It is the explanatory view showing the storing field of the memory in the printing version listing device shown in drawing 1.

[Drawing 9] It is the conceptual diagram showing notionally the arrangement relation of the printing version in presswork and fountain by the conventional printing machine.

[Description of Notations]

1 The Printing Version

8, 81, 82, 83, 84 Division field (inspection zone)

10 Exposure Section

13 Plate

30 Scan Control Section

40 Image Control Section

50 Streak Field Calculation Section

60 Rate Operation Part of Area

70 CPU

80 Memory

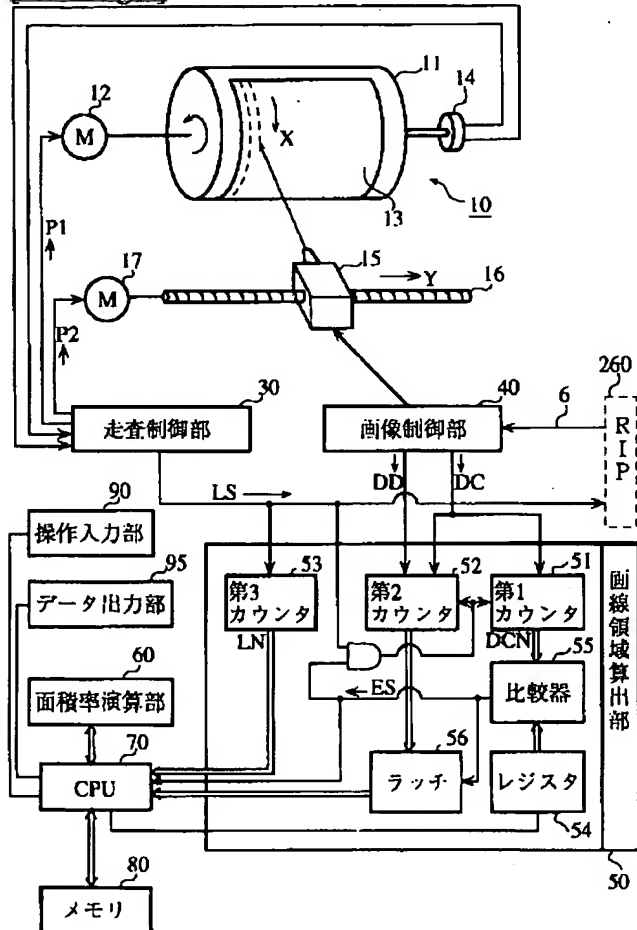
100 The Printing Version Listing Device

[Translation done.]

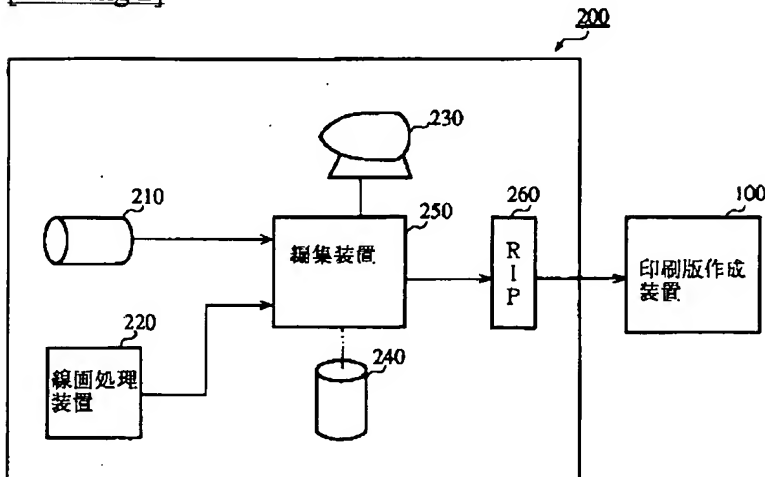
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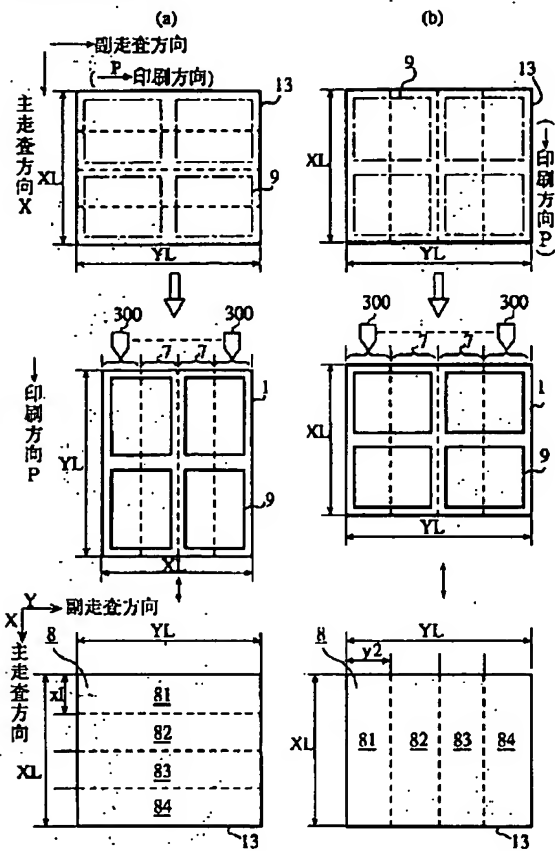
[Drawing 1]



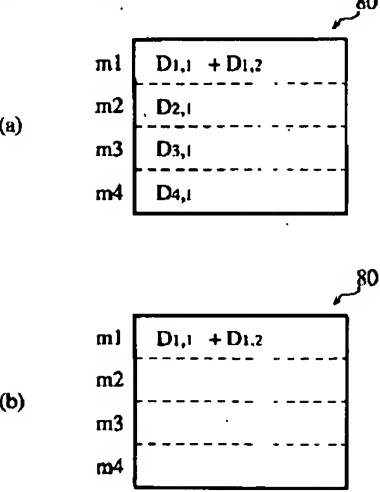
[Drawing 2]



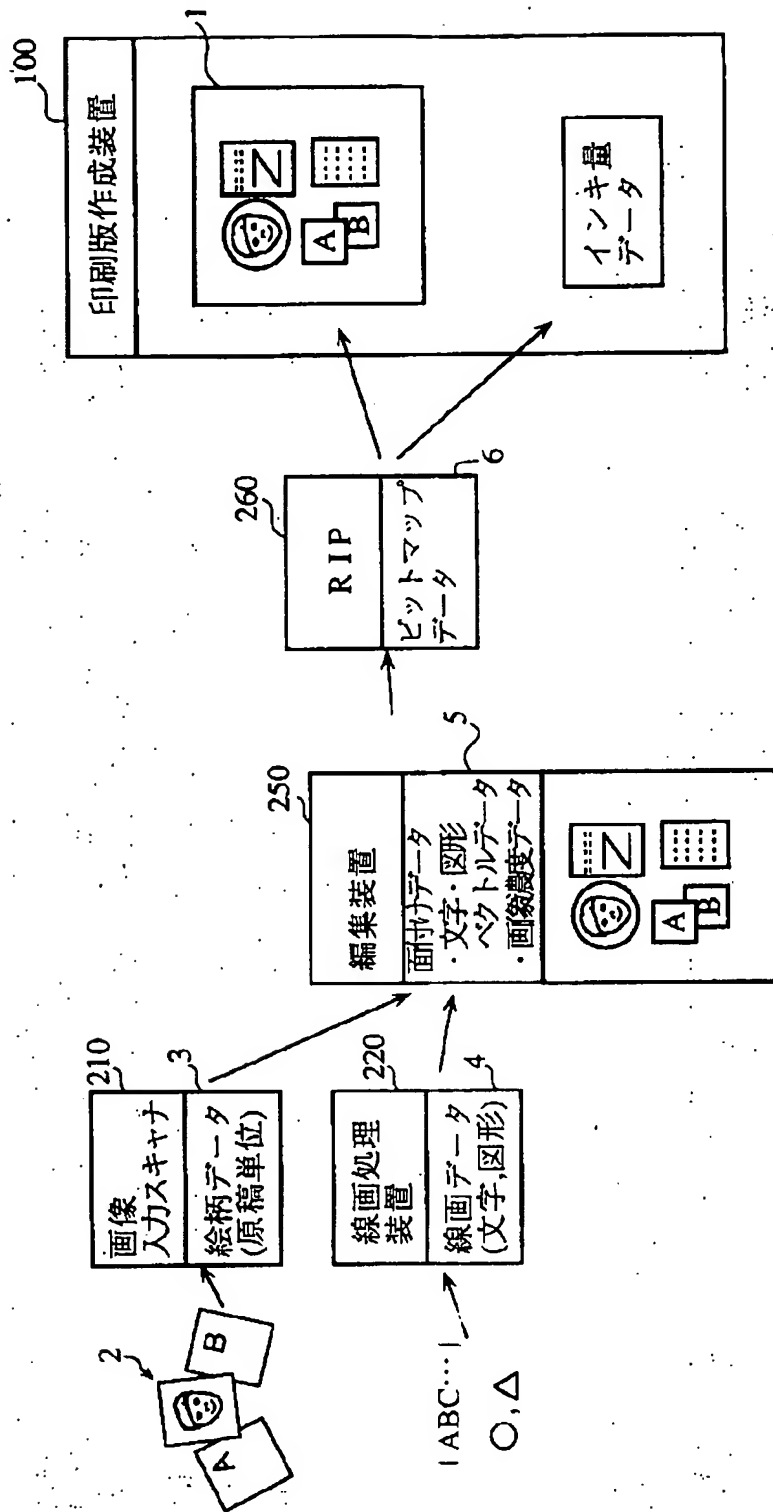
[Drawing 4]



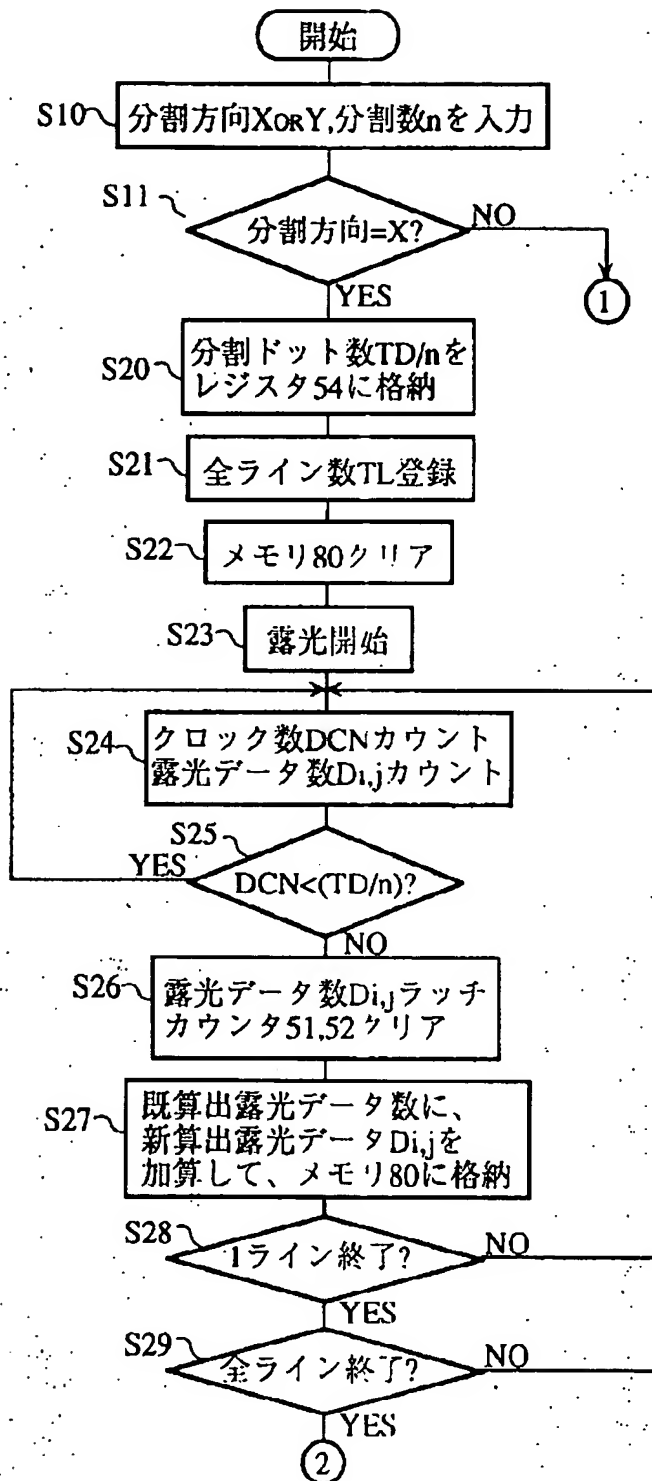
[Drawing 8]



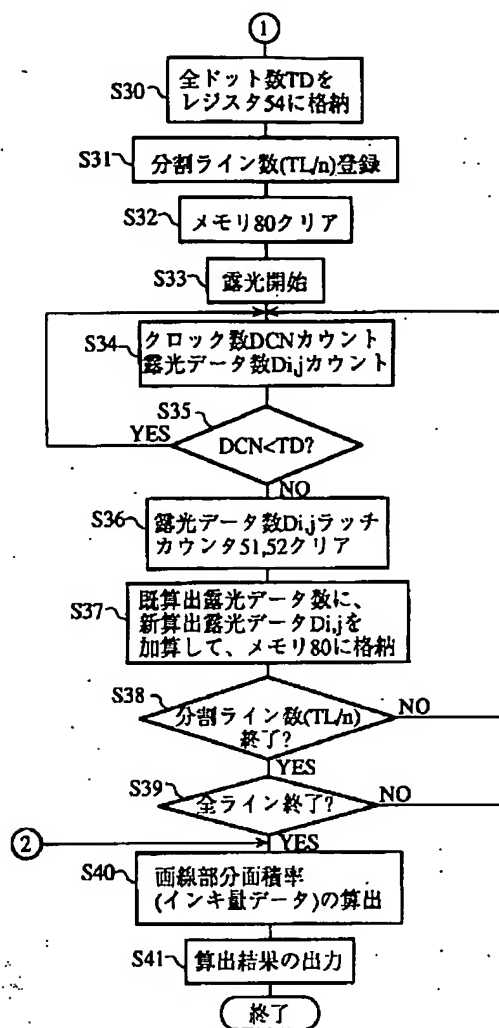
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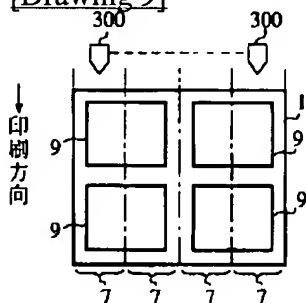
[Drawing 5]



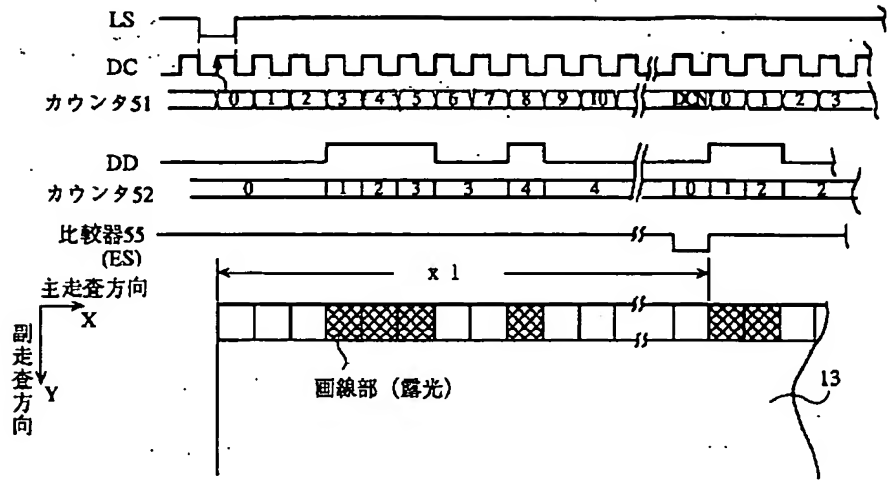
[Drawing 6]



[Drawing 9]



[Drawing 7]



[Translation done.]